

**IN THE CLAIMS:**

Please amend claim 1, as follows.

1. (Currently Amended) An automatic speech recognition system, which recognizes speeches in acoustic signals detected by a plurality of microphones as character information, the system comprising:

a sound source localization module configured to localize a sound direction corresponding to a specified speaker based on the acoustic signals detected by the plurality of microphones;

a feature extractor configured to extract features of speech signals included in one or more pieces of information detected by the plurality of microphones;

an acoustic model memory configured to store direction-dependent acoustic models that are adjusted to a plurality of directions at intervals;

an acoustic model composition module configured to compose an acoustic model adjusted to the sound direction, which is localized by the sound source localization module, based on the direction-dependent acoustic models in the acoustic model memory, the acoustic model composition module also configured to store the acoustic model in the acoustic model memory; and

a speech recognition module configured to recognize the features extracted by the feature extractor as character information using the acoustic model composed by the acoustic model composition module;

wherein the acoustic model composition module is configured to compose an acoustic model for the sound direction.

2. (Previously Presented) An automatic speech recognition system, which recognizes speeches of a specified speaker in acoustic signals detected by a plurality of microphones as character information, the system comprising:

a sound source localization module configured to localize a sound direction corresponding to the specified speaker based on the acoustic signals detected by the plurality of microphones;

a sound source separation module configured to separate speech signals of the specified speaker from the acoustic signals based on the sound direction localized by the sound source localization module;

a feature extractor configured to extract features of the speech signals separated by the sound source separation module;

an acoustic model memory configured to store direction-dependent acoustic models that are adjusted to a plurality of directions at intervals;

an acoustic model composition module configured to compose an acoustic model adjusted to the sound direction, which is localized by the sound source localization module, based on the direction-dependent acoustic models in the acoustic model memory, the acoustic model composition module is configured to store the acoustic model in the acoustic model memory; and

a speech recognition module configured to recognize the features extracted by the feature extractor as character information using the acoustic model composed by the acoustic model composition module.

3. (Previously Presented) A system according to claim 1, wherein the sound source localization module is further configured to:

perform a frequency analysis for the acoustic signals detected by the microphones to extract harmonic relationships;

acquire an intensity difference and a phase difference for the harmonic relationships extracted through the plurality of microphones;

acquire belief factors for a sound direction based on the intensity difference and the phase difference, respectively; and

determine a most probable sound direction.

4. (Previously Presented) A system according to claim 1, wherein the sound source localization module is further configured to employ a scattering theory to generate a model for an acoustic signal, which scatters on a surface of a member to which the microphones are attached, according to a sound direction so as to specify the sound direction for the speaker with the intensity difference and the phase difference detected from the plurality of microphones.

5. (Previously Presented) A system according to claim 2, wherein the sound source separation module is further configured to employ an active direction-pass filter so as to separate speeches, the filter is configured to:

separate speeches by a narrower directional band when a sound direction, which is localized by the sound source localization module, lies close to a front, which is defined by an arrangement of the plurality of microphones; and

separate speeches by a wider directional band when the sound direction lies apart from the front.

6. (Previously Presented) A system according to claim 1, wherein the acoustic model composition module is configured to compose an acoustic model for the sound direction by applying weighted linear summation to the direction-dependent acoustic models in the acoustic model memory, and weights introduced into the linear summation are determined by training.

7. (Previously Presented) A system according to claim 1, further comprising a speaker identification module,

wherein the acoustic model memory is further configured to possess the direction-dependent acoustic models for respective speakers, and

wherein the acoustic model composition module is further configured to:

refer to direction-dependent acoustic models of a speaker who is identified by the speaker identifying module and to a sound direction localized by the sound source localization module;

compose an acoustic model for the sound direction based on the direction-dependent acoustic models in the acoustic model memory; and

storing the acoustic model in the acoustic model memory.

8. (Previously Presented) An automatic speech recognition system, which recognizes speeches of a specified speaker in acoustic signals detected by a plurality of microphones as character information, the system comprising:

a sound source localization module configured to localize a sound direction corresponding to the specified speaker based on the acoustic signals detected by the plurality of microphones;

a stream tracking module configured to store the sound direction localized by the sound source localization module so as to estimate a direction in which the specified speaker is moving, the stream tracking module estimating a current position of the speaker according to the estimated direction;

a sound source separation module configured to separate speech signals of the specified speaker from the acoustic signals based on a sound direction, which is determined by the current position of the speaker estimated by the stream tracking module;

a feature extractor configured to extract features of the speech signals separated by the sound source separation module;

an acoustic model memory configured store direction-dependent acoustic models that are adjusted to a plurality of directions at intervals;

an acoustic model composition module configured to compose an acoustic model adjusted to the sound direction, which is localized by the sound source localization module, based on the direction-dependent acoustic models in the acoustic model memory, the acoustic model composition module is configured to store the acoustic model in the acoustic model memory; and

a speech recognition module configured to recognize the features extracted by the feature extractor as character information using the acoustic model composed by the acoustic model composition module.

9. (Previously Presented) A system according to claim 2, wherein the sound source localization module is configured to:

perform a frequency analysis for the acoustic signals detected by the microphones to extract harmonic relationships;

acquire an intensity difference and a phase difference for the harmonic relationships extracted through the plurality of microphones;

acquire belief factors for a sound direction based on the intensity difference and the phase difference, respectively; and

determine a most probable sound direction.

10. (Previously Presented) A system according to claim 2, wherein the sound source localization module configured to employ a scattering theory to generate a model for an acoustic signal, which scatters on a surface of a member to which the microphones are attached, according to a sound direction so as to specify the sound direction for the speaker with the intensity difference and the phase difference detected from the plurality of microphones.

11. (Previously Presented) A system according to claim 2, wherein the acoustic model composition module is configured to compose an acoustic model for the sound direction by applying weighted linear summation to the direction-dependent acoustic models in the acoustic model memory, and weights introduced into the linear summation are determined by training.

12. (Previously Presented) A system according to claim 2, further comprising a speaker identification module,

wherein the acoustic model memory is further configured to possess the direction-dependent acoustic models for respective speakers, and

wherein the acoustic model composition module is further configured to:

refer to direction-dependent acoustic models of a speaker who is identified by the speaker identifying module and to a sound direction localized by the sound source localization module;

compose an acoustic model for the sound direction based on the direction-dependent acoustic models in the acoustic model memory; and

store the acoustic model in the acoustic model memory.